

The impact of the Belgian workers' compensation system on return to work after rotator cuff surgery

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We retrospectively assessed time off work after rotator cuff repair, in relation with the compensation system and the shoulder loading demand at work.

The Belgian insurance system distinguishes three main financial compensation systems for time off work. Patients with a work-related accident receive the highest compensation. A second group includes employees suffering a private accident or a chronic rotator cuff tear. Self-employed workers receive the lowest compensation.

Work-demand on the shoulder was graded level I to IV according to the Iannotti classification.

From a series of 201 young patients who underwent rotator cuff tear surgery, 93 were selected based on specific inclusion criteria ; of these 93 patients, 73 could be thoroughly investigated.

We found a significantly longer postoperative time off work in the highest compensation group (7 months versus 2.5 months for the lowest compensation group).

We found a significantly longer postoperative time to return to work in the higher stages of the Iannotti classification.

Based on the results of this study, the probable postoperative absence from work can be roughly estimated for each patient after rotator cuff surgery in relation with the particular compensation system and particular occupational demand level.

Keywords : rotator cuff repair ; time off work ; compensation system ; work demand.

INTRODUCTION

Many reports have reported the effectiveness of surgical repair of rotator cuff tears not responding to conservative treatment. Only a few studies have taken into account workers' compensation and the level of work-demand on the shoulder.

Rotator cuff tears are a common cause of disability related to the shoulder and upper extremity in the working population. Nowadays rotator cuff repair results in good to excellent outcomes in most patients (4). Age, sex, smoking, larger size tears, poor tendon quality, fatty degeneration of the cuff muscles, poor repair integrity and workers' compensation status have been shown to be associated with less favourable outcomes (2). Workers'

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compensation systems were designed to provide medical coverage and financial support for the worker during time off work. In Belgium there are three main compensation systems : In work-related injuries a relatively high compensation is paid by the insurance company of the employer. In all other cases of illness or injury, compensation is provided by the national health insurance system. Compensation level is significantly lower for the self-employed worker compared to the employee. Several studies demonstrated less successful results, in terms of time to return to full-duty work, after rotator cuff repair in patients, receiving a high workers' compensation (4,8). To our knowledge, little is known about the influence of the workers'-compensation in the Belgian insurance system, concerning the time to return to work after rotator cuff surgery. In the Belgian insurance system, either the surgeon or the general practitioner of the patient advises the insurance company about the duration of the temporary absence from work. In most cases this advice is accepted by the medical staff of the insurance company.

The purpose of the present study is to examine the correlation between workers' compensation status and time to return to work after rotator cuff repair. This study should give the Belgian surgeon and patient an idea about the average time to return to full-duty work after surgery and the influence of the work demand level of the patients' occupation.

PATIENTS AND METHODS

We studied all unilateral primary rotator cuff repairs in working patients, operated between January 2004 and December 2008 at our hospital. All the rotator cuff repairs and follow-up were performed by either one of the two senior surgeons on our staff, familiar with shoulder surgery. One surgeon used an open procedure, the other an arthroscopic technique. There were 34 open and 39 arthroscopic rotator cuff repairs.

The data were collected retrospectively by an independent researcher who was not involved in the treatment. During treatment, neither the surgeon nor the patient were aware that there would be a study about the duration of absence from work.

The inclusion criteria for this study were unilateral primary rotator cuff repairs, in the young working population, between 18 and 55 years of age, living and working in Belgium and working under the Belgian insurance system. Ninety three patients were included in the study. Two patients died. The correspondence address was incorrect for 6 other patients. Eighty five patients were traced, to be interviewed by the independent investigator. Fifty one patients answered the questions orally. After three unanswered phone calls, the questionnaire was sent to the patients' correspondence address. Twenty two of the 34 written questionnaires were returned. We finally collected a total of 73 completed files, from 37 male and 36 female patients. The average age at the time of surgery was 49 years (range : 36 to 55). The age of 55 years was chosen as an upper limit, because early retirement in situations of chronic illness is possible above 55 years in Belgium.

The questionnaires included questions concerning the cause of the rotator cuff tear (chronic or acute and private or work related), the physical demand level on the shoulder of the patients' occupation, preoperative time off work, delay of work resumption after surgery and return (if ever) to preoperative level of physical demand on the shoulder.

To get an idea of the level of physical demand on the shoulder involved with the patient's occupation, we used two criteria. The average load lifted during daily activities was graded as 0 with a desk-job, 1 when lifting was limited to less than 15 kilograms, 2 with 15 to 25 kilograms, and 3 when more than 25 kilograms was lifted. The frequency of working above shoulder level was determined : A : seldom, B : several times a week and C : almost continuously.

Iannotti *et al* (7) combined the average lifted load and the frequency of working above shoulder level to classify patients' occupation and its related level of physical demand on the shoulder : I : sedentary (0), II light (1A, 1B, 2A), III medium, (1C, 2B, 2C) and IV heavy (3A, 3B, 3C) (table I).

Applying the Iannotti classification to our patient population, we had 9 patients in the sedentary group (Iannotti level I), 25 patients in the light (Iannotti level II) group, 18 patients in the medium (Iannotti

Table I. — Work-demand level – Iannotti level.

Above shoulder level:	seldom	<3d/week	continuously
Carried weight			
(0)	I		
(1): < 15kg	II	II	III
(2): 15 - 25 kg	II	III	III
(3): > 25 kg	IV	IV	IV

The combination of the carried weight and the frequency of working above shoulder level determines the physical demand level of patients occupation, which is defined by Iannotti in four levels.

level III) group and 21 patients in the heavy (Iannotti level IV) group. The 4 Iannotti groups were not significantly different for age, sex and operation technique (open/arthroscopic).

The shoulder disability was the result of an acute injury in 42 patients (57%). Nine of these 42 (21%) acute injuries were work-related accidents and all 9 patients stated that they had no shoulder disability or complaints prior to the accident.

Thirty-one patients had a chronic shoulder condition with or without an acute incident. In 13 of these 31 patients, the rotator cuff tear was the result of an acute incident on top of a chronic shoulder disability. In the other 18 patients, a rotator cuff tear was diagnosed without a previous acute incident.

Twenty one of the 39 patients in our study aged below 50 years (54%) experienced an acute incident, versus 20 of the 34 patients aged above 50 years (59%).

Eight of the 9 patients (89%) who incurred the rotator cuff tear at work had been off work preoperatively, compared to only 15 of the 33 patients (45%) who incurred an acute rotator cuff tear without a work related incident.

Only 8 of the 39 patients (26%) with a chronic rotator cuff tear were off work preoperatively, and only 2 of the 9 self employed workers (22%) had stopped working preoperatively.

RESULTS

We divided the 73 patients into three groups according to their compensation status in the Belgium compensation system.

The **first group** of 9 patients had a work-related accident and continued to receive a full salary paid by the insurance company of the employer. They received the highest compensation.

The **second group** consisted of 55 employees who had a private accident or chronic rotator cuff tear and were paid a compensation by the national health insurance system, which is lower than in the first group.

Nine self-employed workers receiving the lowest compensation by the national health insurance system formed the **third group**.

There were no statistically significant differences between those groups concerning age, sex and operation technique (Student t- test , $p < 0.05$).

The 9 self-employed workers (group III) had an average postoperative time to return to work of 2.4 months (median of 2.5 months, range : 0-5 months).

In the second group the average postoperative time to return to work was 4.7 months (median : 4 range 0-13 months).

The average time to return to work for these patients receiving the highest workers' compensation (group I) is more than seven months (median of 6 months with range : 3-15 months) (fig 1).

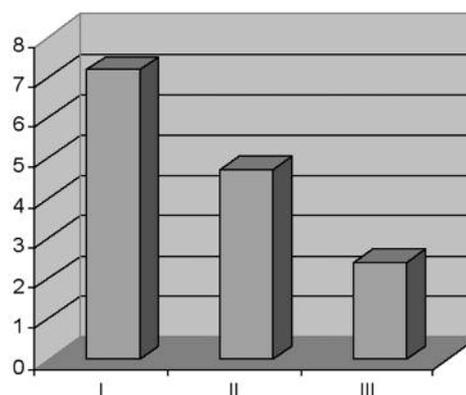


Fig 1. — Time off work in relation to compensation system (in months). Group I : the postoperative time to return to work is 7.2 months. In group II : 4.7 months and in group III : 2.4 months.

In the sedentary **level I** of the Iannotti classification all patients returned to their previous occupation after surgery, with a mean delay of 0.7 months (range : 0-9 months).

Three of the 25 patients of Iannotti **level group II** did not return to work after their surgical rotator cuff repair. In this light work-demand level group the mean time to return to work was 3 months (range : 0-12 months).

In the Iannotti **level III** four of the 18 patients (22 %) could not return to their previous work-demand level and they had to change to a more adapted occupation. The mean time to return to work for these patients is 4 months (range : 1-15 months).

In the heavy work-demand **level IV** of the Iannotti classification, 5 of 21 patients (24%) could not return to their previous occupation. The mean time to return to work in this stage is 6 months (range 0.75 – 13 months) (fig 2).

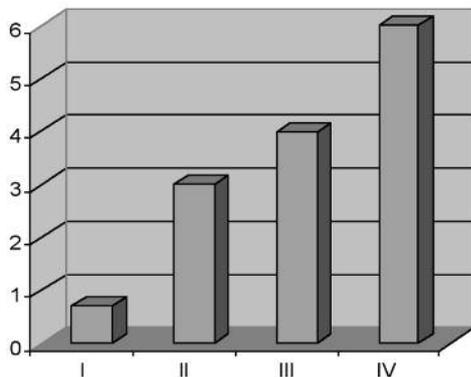


Fig 2. — Time off work in relation to Iannotti level. Time to return to work : Iannotti level I : 0.7 months, level II : 3 months, level III : 4 months and level IV : 6 months.

Overall we saw no correlation between age and time to return to work.

The postoperative complication rate was very low : 1 neurological injury and 2 post-operative frozen shoulders were reported.

DISCUSSION

A PubMed aided literature search using keywords (shoulder, workers' compensation, Belgian),

did not reveal any previous Belgian study examining the relationship between time to return to work after rotator cuff repair considering work-demand level and/or worker's compensation status. In this study, we found an average postoperative time to return to work of more than 7 months in patients (group I) receiving workers' compensation after a rotator cuff tear caused by a work-related accident, 4 months for patients (group II) receiving workers' compensation after a non work-related accident and hardly 2 months for the self-employed workers (group III).

A similar tendency existed in preoperative absence from work. Almost 90% of patients with a work-related accident were off work prior to surgery compared to only 45% of the patients with a rotator cuff tear after a non work-related accident. These results are in agreement with previous reports in the international literature. Most of these reports compared workers compensation board recipients and non recipients. They did not divide the recipients in subgroups according to the level of their compensation.

In 2009 Koljonen *et al* published a review article concerning outcome of shoulder surgery between workers' compensation and non-workers' compensation populations (8). This systematic review and meta-analysis of all surgical literature concerning shoulder operations showed a strong association between workers' compensation status of an individual receiving shoulder surgery and a poor surgical outcome. Misamore *et al* concluded that only 54% were rated good or excellent in the workers' compensation group compared to 92% of the patient who were not receiving worker's compensation (9). In 2008 Henn *et al* concluded that patients with workers compensation claims have worse outcomes after rotator cuff repair (5).

We found a statistically significant difference when comparing the three groups for their activity level. The majority of patients (group I) with a rotator cuff tear caused by a work-related accident are categorized in a significantly higher activity stage of the Iannotti work-demand level classification. In our study of 9 patients who were receiving workers compensation after an industrial accident, 7 were categorized in level III or IV of the Iannotti classi-

fication system. Six of these 9 patients were even categorized in level IV

Many previous reports did not take into account this level of physical demand and workload to which the patient must return (10). However, Fieman and Fenlin highlight that one of the reasons that injured workers take a longer time to return to work is because of their involvement in heavier labour, demanding a more complete return of postoperative shoulder function (3). This is in agreement with our findings.

Previous studies demonstrated that preoperative expectations of treatment may have a strong influence on treatment outcomes (4).

Cole *et al* demonstrated that greater recovery expectations among patients with a workers compensation claim who had a soft-tissue injury were associated with significantly decreased pain levels and better general health status at the time of follow-up (2). In addition Razmjou *et al* stated that the majority of patients in their study expected a high level of pain relief and improved physical activity. Such expectations may not be realistic in situations where pathology is serious (11). We think that there is a pressing need to determine a realistic expectation regarding time to return to work after a rotator cuff repair. Balyk *et al* stated that clinicians should consider preoperative work characteristics before concluding that worker's compensation board recipients experience less recovery after surgical repair (1). The results of our study offer a guideline for absence from work that can be expected according to compensation system and shoulder work load.

This study has several shortcomings. Only 73 patients treated at one centre over a period of 5 years were involved. A larger sample of patients seen in multiple clinics would be more representative for the general population.

We did not take into account medical comorbidities of our patients, the smoking status of the patient and possible alcohol consumption.

Because the study is retrospective, preoperative expectation of patients was not recorded.

One of the strongest limitations is the lack of information on the extent of the rotator cuff tear, the mobility of the retracted tendon, the quality of the remaining cuff tissue and biceps tendon.

CONCLUSION

The present study and the majority of research in this area documented that a high workers' compensation status is a positive predictor of poor postoperative functional outcome and long absence from work following rotator cuff repair.

In group I of the Belgian insurance system, the postoperative time to return to work is 7 months, in group II, 4 months and in group III, the least compensated group, it is only 2.5 months.

However, as stated before, there are different factors that determine the time to return to full-duty work. One of the important factors is the work-demand level of the specific patients's occupation. In our study we found a mean time to return to work ranging from less than one month in Iannotti work demand level I, three months in Iannotti level II, four months in level III, and six months in Iannotti level IV. These findings could serve as a reference in daily practice dealing with these problems.

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